

### **Remarks**

Claims 1-10, and 13-45 are currently pending in the application. Claims 1, 2, 7, 8, 10, 20, 21, 24, 25, 26, 27, 30, 35, 36, 37, 43, 44 and 45 have been amended in this response. Claims 3, 4, 6, 38 and 39 have been cancelled.

The previous office action indicated that claim 45 would be allowable if re-written in independent form including all the limitations of the base claim (claim 44). Accordingly, the present amendments re-write claim 45 as an independent claim incorporating the features of previous claim 44 upon which it was dependent. Claim 45 is therefore submitted to be allowable.

Amendments have been made to the remaining independent claims to incorporate some of the features from present claim 45, and previous claims 3, 4 and 6, 38 and 39.

Specifically, amendments being made in this response amend the remaining independent claims to recite that the sleeve is clamped to the drill string or tubular.

Basis for the amendments made can be found in page 9 lines 15-19, which discloses a sleeve being "tightly fastened" to a drill string without a separate annular clamping device; page 10 lines 9-18, which discloses the annular clamp being applied to the outer surface of the sleeve after the sleeve has been connected to the drill string (by clamping in the same manner as the annular clamp), and page 3 lines 1-5, where it is made clear that the fixing of the sleeve to the drill string can be made by means such as an annular clamp .

No new matter has been added by these amendments.

### ***Claim Objections – Informalities***

Claim 36 was objected to because of informalities. In response, claim 36 has hereby been corrected to commence with “A method” rather than “The method”, and to introduce the “an” as helpfully suggested by the Examiner. The wording “The method/The apparatus” suggested by the Examiner in the first office action has been retained in the other claims.

It is respectfully submitted that the Examiner’s objections in paragraph 2 of the office action are hereby overcome.

### ***Claim rejections – 35 USC § 112***

Claims 1-10 and 13-43 were objected to because of the wording relating to the “clamp” which clamps “the apparatus” to the string. The claims have been amended herein to clarify that in accordance with the teaching in the originally filed PCT application at the passages on pages 3, 9 and 10 cited above, the sleeve (e.g. sleeve 5) is clamped to the drill string or tubular, and the bushing (e.g. bushing 7) rotates on the bearing region of the sleeve 5. The sleeve 5 can optionally be clamped to the drill string by means of an annular clamp (e.g. annular clamp 9), or by other fixing means. Basis for the amendments made can be found in page 9 lines 15-19, which discloses a sleeve being tightly fastened to a drill string without a separate annular clamping device; page 10 lines 9-18, which discloses the annular clamp being applied to the outer surface of the

sleeve after the sleeve has been connected to the drill string (by clamping in the same manner as the annular clamp); and page 3 lines 1-5, where it is made clear that the fixing of the sleeve to the drill string can be via an annular clamp or by other means. Clarity of the claims has been improved as a result of the present amendments, and the independent claims are now consistent with the description and drawings. Accordingly it is respectfully submitted that the objections raised in paragraphs 3 and 4 of the office action have been overcome by these amendments.

***Claim rejections – 35 USC § 102***

Claims 1-7, 10, 13-15, 20-22, 24, 26-33, 35-42, and 44 were rejected under USC 102(b) as being anticipated by Yancey (US2794617) in paragraph 6 of the office action.

Applicant has hereby amended independent claims 1, 35, 36, and 44 to recite that the sleeve is:

*adapted to be opened to fit around a drill string (the tubular) in the well, and to be closed around the drill string (the tubular) and clamped thereon to secure the sleeve to the drill string (the tubular),*

This is supported in the specification as filed at page 3 line 4 and at page 9 lines 13-15.

Yancey does not disclose or suggest any features allowing the device therein to be opened to fit around a drill string and then closed around the string and clamped in location as now claimed. Yancey does not appear to disclose anything about how the elements 14 and 22 might be assembled and there is certainly nothing in Yancey that

leads a skilled person to open and clamp the elements around the string in the manner claimed.

In contrast with the embodiments of the invention, the annular members in Yancey including the sub 14 and mandrel 22 referred to by the Examiner are not capable of opening and being clamped around anything at all, and if Yancey teaches anything about attaching the vanes and blades to the drill string it is that they must be assembled in predetermined positions by passing the reduced central section of the mandrel 32 through the central hole in the annular impeller 36.

The apparatus of the embodiments of the invention is provided separately of the drill string and clamped onto an already-formed drill string. This allows freedom of choice in selecting an appropriate position on the outer surface of the string to fit the conditions the string will face downhole. No such freedom is contemplated or possible with the design described by Yancey.

The embodiments of the apparatus of the present invention therefore permit additional versatility in selecting its position on the string, as well as enhanced flexibility of the assembled string as a result of fewer screw connections in the drill string as explained in the previous response. Also, the embodiments of the present invention allow freedom of design in the selection of the material making up the components, saving on materials and costs and deck space because only a single variant of the embodiments of the present invention needs to be carried on a rig.

To anticipate a claim, the reference must teach every element of the claim (MPEP §2131), a criteria which Yancey does not meet as discussed above. Accordingly it is

submitted that Yancey does not anticipate the invention of Claims 1, 35 and 36 under 35 U.S.C. 102(a). It is therefor respectfully requested that such rejection be withdrawn. The remaining claims are also allowable by reason of their being directly or indirectly dependent from one of claims 1, 35, or 36.

***Claim rejections – 35 USC § 103***

Claims 8, 9, and 16-19 were rejected in paragraph 8 of the office action under 35 USC § 103(a) as being obvious on the basis of Yancey in view of Zublin (US2005767).

Claims 8, 9, 16-19 all include the recitations of independent claim 1. Accordingly this objection is traversed at least on the basis of dependency of the rejected claim on an acceptable base claim.

Also, the Zublin device is not intended to be used with a drill string. It is a separate agitator tool designed to sit passively in the well to stimulate well flow, and is used during the post-drilling production phase of a well. The Yancey device on the other hand is designed to be integrated in a drill string during the drilling phase. Thus, the Zublin and Yancey references concern fundamentally different applications and therefore a skilled person aiming to improve the Yancey system and looking to Zublin for that purpose would not consider that the Zublin system had anything to offer by way of improvement.

Also Zublin shares the non-clamping design of Yancey, and the agitators 131 on the construction in Fig. 11 referred to by the Examiner are not capable of opening to fit around a drill string and closing around it to clamp the agitator in place. Neither Yancey

or Zublin discloses this feature. Therefore, even if the device of Zublin was capable of being combined with Yancey, which is not admitted, then the alleged combination would still fail to teach, suggest, or motivate one skilled in the art to the embodiments of the invention. Accordingly, the rejection under 35 USC § 103(a) is respectfully traversed.

Claims 23 and 25 were rejected in paragraph 9 of the office action under 35 USC § 103(a) as being obvious over Yancey.

Claims 23 and 25 are all dependent on claim 1, and therefore include the recitations of the base claim, as set out above. Accordingly, the rejection in paragraph 8 is hereby traversed at least on the basis of dependency of the rejected claims on an acceptable base claim.

Claim 34 was rejected in paragraph 10 of the office action under 35 USC § 103(a) as being obvious on the basis of Yancey in view of Shizawa (JP62101149).

In response, applicant submits that Shizawa is not concerned with wellbore apparatus, and does not consider any of the problems solved by the embodiments of the present invention. A skilled person would derive no teaching, suggestion, or motivation from Shizawa to adapt the Yancey apparatus to incorporate a clamping engagement of the sleeve to the drill string as in the claimed invention.

Furthermore, the mixing device shown in Fig. 1 of Shizawa is clearly not capable of opening and closing around a drill string as claimed. Therefore even if the Yancey and Shizawa documents were considered in combination, the combined disclosure does not disclose or suggest the feature of being adapted to open and close around a drill string

to enable the apparatus to be clamped to a drill string in use, and thus it would not be possible for a skilled person to arrive at the embodiments of the invention on the basis of these references. The rejection in paragraph 10 is therefore most respectfully traversed.

Claims 1, 35 and 36 were rejected in paragraph 11 of the Office Action under 35 USC § 103(a) as being obvious over Yancey. These claims have been amended to more clearly recite the feature that the sleeve is:

*“adapted to be opened to fit around a drill string in the well, and to be closed around the drill string and clamped thereon to secure the sleeve to the drill string,”....*

This is supported in the specification as filed at page 3 line 4 and at page 9 lines 13-15.

The amended claims 1, 35 and 36 also combine the recitation of features from cancelled claims 3, 4, 6, 38 and 39 to the extent that the “vanes” are:

*“provided on the sleeve, the sleeve having a bearing region, at least one bushing that is rotatably mounted on the bearing region of the sleeve, with at least two blades mounted on the bushing”*

Firstly, Yancey does not teach or suggest any features allowing the device therein to be opened to fit around a drill string and then closed around the string and clamped in location as in the embodiments of the present invention now claimed. Yancey does not appear to disclose anything about the how the elements 14 and 22 might be assembled and there is certainly nothing in Yancey that leads a skilled person to open and clamp

the elements around the string in the manner claimed. As noted above in relation to the objection to these claims under 35 USC § 102(b), applicant submits that Yancey does not teach or suggest anything relating to opening and closing of the sleeve around the drill string.

The examiner has alleged that it would have been obvious to form the sleeve in Yancey in two parts connected by a hinge rather than a solid annular sleeve.

However, modifying the impeller 36 of Yancey to split it into two parts connected by a hinge and then clamping it around the drill string mandrel 22 would still not teach, suggest, or motivate the skilled person to arrive at all of the features of the embodiments of the invention, because a modified clampable Yancey device, even if such was possible, would still lack the features of the sleeve having a “*bearing region, at least one bushing that is rotatably mounted on the bearing region of the sleeve, with at least two blades mounted on the bushing*” These features are now recited in amended claims 1, 35 and 36, and are derived from currently cancelled claims 3, 4 6, 38 and 39, which the Applicant notes were not rejected in the arguments set forth in paragraph 11 of the Office Action. Accordingly the rejection on the basis of Yancey in paragraph 11 is most respectfully traversed.

In contrast with the embodiments of the invention as now claimed, the annular members in Yancey including the sub 14 and mandrel 22 referred to by the Examiner are not capable of opening and being clamped around anything at all, and if Yancey teaches anything about clamping the vanes and blades to the drill string it is that they must be assembled in predetermined positions by passing the reduced central section of the mandrel 32 through the central hole in the annular impeller 36. Forming the impeller 36



in two parts connected with a hinge rather than as a solid annular ring would inevitably create imbalance between the two sides of the impeller, because one side would carry the hinge and the other side would require some kind of catch. This imbalance would undoubtedly affect the spinning behaviour of the impeller, and could lead to wobbling of the impeller during rotation. This would be a very unattractive option for anyone considering improving the Yancey device, particularly because the Yancey device relies on very consistent diameters and low tolerances especially in the vanes and blades. Therefore, the suggested modification to make the Yancey solid annular impeller 36 (with its present consistent diameter and close tolerances which can be set in the factory using calibration equipment) into a two part clamp-on component that necessarily has an inconsistent diameter and weight distribution as a result of the hinge would be considered a step backward by anyone skilled in the art. Also, the notion that it might be an advantage to connect the modified Yancey two-part hinged impeller in the field is not correct, as the skilled person would appreciate that this connection in the field (without sophisticated calibration equipment) would introduce even more uncertainties in the tolerances between the vanes and the blades, which would interfere further with the rotation of the modified impeller.

The embodiments of the apparatus of the invention are provided separately of the drill string and clamped onto an already-formed drill string. As submitted above, this allows freedom of choice in selecting an appropriate position on the outer surface of the string to fit the conditions the string will face downhole. No such freedom is contemplated or possible with the design described by Yancey.

The apparatus of the embodiments of the present invention therefore permits additional versatility in selecting its position on the string, as well as enhanced flexibility of the

assembled string as a result of fewer screw connections in the drill string as explained in the previous response. Also, the embodiments of the present invention allow freedom of design in the selection of the material making up the components, saving on materials and costs and deck space because only a single variant of the embodiments of the present invention needs to be carried on a rig

Accordingly it is submitted that the Examiner's rejections set out in paragraph 11 under 35 USC § 103 based on Yancey should be withdrawn.

It is accordingly respectfully submitted that the Application is now in condition for allowance, and such action is respectfully requested.

The Examiner is invited to contact the undersigned attorney by phone if there are any additional issues that require discussion.

Respectfully submitted,

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